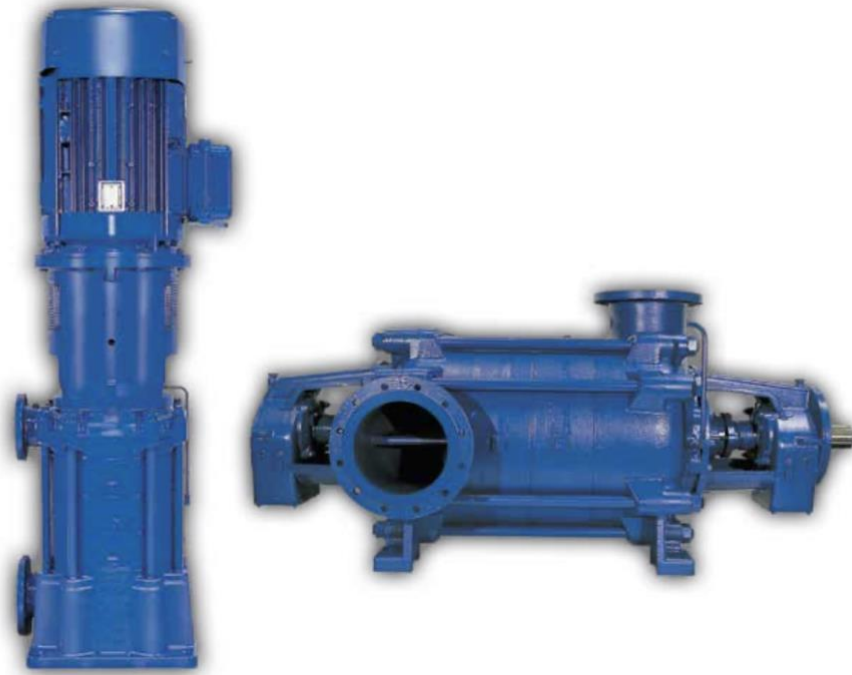




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# Multistage Pumps

## Vogel Series P, PVa, MP 300

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## Technical Data

### Performance range:

- Capacities up to 1800m<sup>3</sup>/h (8800USgpm)
  - Head up to 300m (1000feet)
  - Max. speed up to 1750rpm
- Multistage pumps of series MP with smaller capacities and max. speed up to 3600rpm, refer to separate brochure

### Sizes:

- DN 80 up to DN 300 (3" up to 12") discharge

### Temperature:

- max. 140°C (284°F)

### Casing pressure:

- up to 45bar (650psig)
- For more detailed information about operation limits with regard to material of construction and operating conditions please refer to data sheets or actual quotations.

### Handled liquids:

- Clean and slightly contaminated fluids (without bigger solids)
- hot and cold water
- condensate
- oil suspensions
- acids as well as their watery solutions
- caustic solutions
- brine



### Application:

- water supply
- booster systems
- irrigation
- fire fighting
- cooling circuits
- boiler feed
- condensate
- district heating
- osmosis and ultra filtration
- spray water systems
- cleaning systems
- mining

We have developed and manufactured multistage pumps since 1910. Our application and manufacturing expertise provide you with the BEST SOLUTION to meet your pumping needs.

## Modular System

Multistage pumps utilize a modular design concept which maximizes component interchangeability. As such, multiple design configurations can be engineered to meet customer requirements without compromise to repair part inventories.

The entire performance range is covered by 7 mechanical sizes that hold 9 different hydraulics.

Size	Discharge branch DNd [mm]	Suction branch DNs [mm]	Capacity at BEP Q [m <sup>3</sup> /h]	
			50Hz	60Hz
P, PVA 84	80	100	120	140
P, PVA 104	100	125	170	200
P, PVA 124	125	150	250	300
P, PVA 154	150	200	420	500
P, PVA 204	200	250	660	790
P 253	250	300	800	900 '1)
P 254	250	300	980	1100 '1)
MP 300.1	300	400	1200	-
MP 300.2	300	400	1400	-

1) upon request

## Hydraulics

Sizes 84-254, closed radial type impellers designed for casing wear ring on both sides. Axial thrust minimized by balance holes for minimum bearing loads and maximum bearing lifetime. Size MP 300.1 and MP 300.2 thrust balanced by a balancing drum.

Size 84-104 P: one piece design for diffuser and casing. Size 124 PA-254 P and MP 300.1, 300.2: two piece design for diffuser and stage casing. Balanced radial forces, minimum shaft deflection, minimum vibrations.

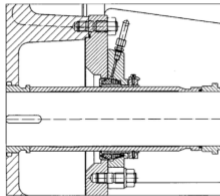
Heavy duty design for long term operation in industrial applications.  
All design versions acc. to ISO 5199 / EN 25199

ISO 9001 + 14001 certifications guarantee high quality standards and reliability of our products as well as environmentally friendly production process.

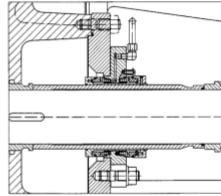


## Cartridge mechanical seal:

Cartridge seals are pre-assembled units that guarantee trouble free mounting as well as reliability. Cartridge seals also minimize the maintenance cost arising while changing the seal.



Single mechanical seal cartridge, also available with Quench.

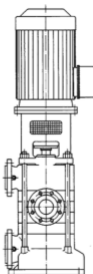
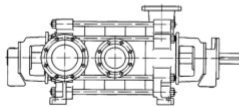


Double mechanical seal cartridge with connection for external flush.

## Pumps with more than one discharge - Multioutlet design:

Multistage pumps in Multioutlet design can be fitted with a random number of discharge branches. The pumps are mostly used in fire fighting applications to serve different pressure zones with different pressure levels.

Multioutlet configurations are not only available in horizontal execution for design PM (PMA), but also in vertical execution for design PVA.



## Materials

Material Code	Impeller	Difusors	Stage casing	Suction casing	Discharge casing	Casing wear ring	Shaft	Shaft sleeves
<b>Standard materials</b>								
N	0.6025	0.6025	0.6025	0.6025	0.6025	'1)	1.4021	1.4021
SN	CC480K	0.6025	0.6025	0.6025	0.6025	'1)	1.4021	1.4021
VN	1.4408	0.6025	0.6025	0.6025	0.6025	'1)	1.4021	1.4021
VV	1.4408	1.4408	1.4408	1.4408	1.4408	1.4462	1.4462	1.4462
<b>Material options</b>								
NL	0.6025	0.6025	0.7040	0.7040	0.7040	'1)	1.4021	1.4021
VL	1.4408	0.6025	0.7040	0.7040	0.7040	'1)	1.4021	1.4021
NF	0.6025	0.6025	1.0619	1.0619	1.0619	'1)	1.4021	1.4021
VF	1.4408	0.6025	1.0619	1.0619	1.0619	'1)	1.4021	1.4021

1) Optional casing wear rings made of 1.4462

Elastics (O-rings) EPDM for hot water up to 140°C, optional VITON (Pay attention to operation limits and chemical resistance), temperature and pressure operating limits depending on material version, please refer to techn. data sheets.

### Materials - Comparison of various standards

DIN 17007	DIN 17006	ISO	BSI (UK)	AISI	ASTM
0.6025	EN-GJL-250 (GG 25)	185/Gr. 250	1452 Gr. 220		A 278 Class 30
0.7040	EN-GJS-400-15 (GGG 40)	1083/400-12			A 536 Gr. 60-40-18
1.0619	GP 240 GH (GS-C 25)		1504 161 Gr. 480		A 216 Gr. WCB
CC480K	G-CuSn10				B 584 C 90700
1.4021	X20Cr13	683-13-4	970 420 S 37	420	A 276 Type 420
1.4408	G-X6CrNiMo 18-10		3100-316 C 16	CF8M	A 743 CF8M
1.4462	X2CrNiMoN22-5-3		1503 318 S13		A 276 S31803

### Mechanical seal materials - Standard materials

DIN Code	Mech. seal	Stationary ring	Elastics	Metal parts
BQ 1 EGG	Carbon '1)	SIC '2)	EPDM	1.4571
BQ 1 VGG	Carbon '1)	SIC '2)	Viton	1.4571
QT Q1 VGG	SIC '2)	SIC '2)	Viton	1.4571

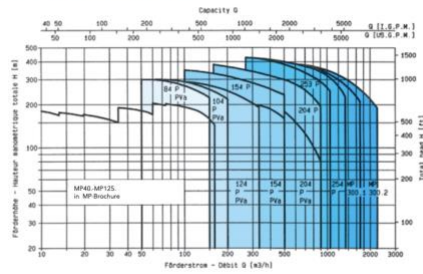
1) Carbon resin impregnated  
2) Pure silicon carbide (without free silicon)

Application limits regarding pressure, temperature and speed as well as chemical resistance refer to data sheets or actual quotations.

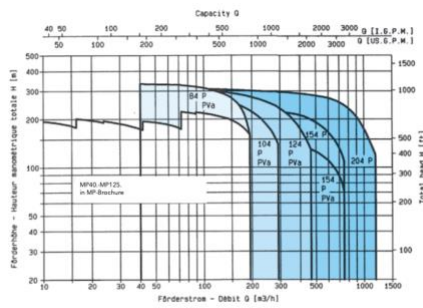
Optional materials upon request.



Performance range - 50 Hz, 1450rpm



Performance range - 60 Hz, 1750rpm



Design Versions

Type P, PA, MP 300:

Horizontal design with bearings at both ends, drive-end at discharge side (standard), rotation clockwise, with suction branch left and discharge branch radially upwards, oil lubrication. Counter clockwise rotation and other flange orientations are, optionally available.

Type PVA:

Vertical design with separate thrust bearing and flexible coupling between motor and pump. Standard IEC motors, up to 315kW.

Type PT:

Vertical wet pit configuration length: max. 10m - 1450 / 1750rpm Inducer design available.

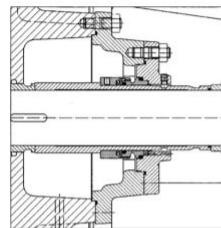


Shaft Seal Options

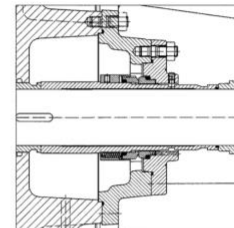
Mechanical seals:

Seal chamber dimensions comply with ISO 3096. Mechanical seals of all brands complying with this standard and EN 12756, version „k“ can be used without modification of the standard parts.

An internal flush system guarantees optimum lubrication and cooling of seal faces.

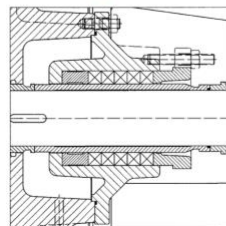


Single mech. seal, Design U unbalanced up to max. 16 bar

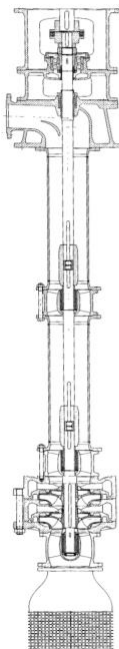


Single mech. seal, Design B balanced up to max. 45 bar

Gland packing:



The availability of gland packings is limited to max. operation pressure of 25bar. Above 25bar operation pressure only mechanical seals are available.



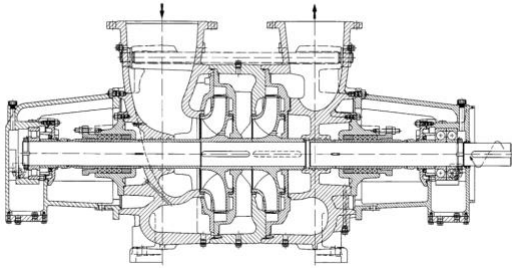
Design features PT:

- o Vertical wet pit design.
- o Installation length: 1450/1750rpm - max.10 m
- o Separate grease lubricated thrust bearing with grease nipples.
- o Standard motor according to IEC, design V1.
- o Flexible coupling between pump and motor.
- o Drive and discharge branch always above liquid level.
- o Medium lubricated friction bearings in pump body and shaft section. Number of bearings depending on installation length.
- o Suitable for variable speed control.
- o Mechanical seal or gland packing available.
- o Maintenance friendly design.
- o Suction bells, suction strainers or foot valves available.
- o Can design available when pumping hot or condensate media.
- o Inducer design available for low NPSH applications when pumping liquids close to the boiling pressure.



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## Pump Sets



### Design features P:

- Horizontal configuration with outer bearings on both sides.
- Driven by electric motor, combustion engines or steam turbines, via flexible coupling.
- Drive side discharge, clockwise rotation (drive side suction and counter clockwise rotation optionally available).
- Branch directions: suction left viewed from drive end, discharge radially upwards. Branches can be adjusted to meet customer requirements in 90° increments.
- Drive side thrust bearing, two angular contact ball bearings. Suction side roller bearing as floating bearing. Oil lubrication with large oil sump.
- Thermal expansion of pump rotor is internally balanced without affecting the shaft alignment.
- Shaft sealing arrangements (mechanical seal or gland packing) as per „shaft sealing options“.
- Maintenance friendly design. Bearings and shaft seal are maintainable without pump disassembly.

### Accessories available

- baseframes
- couplings
- coupling guards
- motors
- minimum flow valves
- speed control
- special accessories to meet customer requirements



Sizes 84 up to 204 P are available in a space saving vertical design.

### Design features PVa:

- Vertical configuration with separate thrust bearing. Grease lubricated with grease nipples.
- Standard motor according to IEC, design V1, up to 315kW.
- Flexible coupling between pump and motor.
- Medium lubricated friction bearing insuction casing.
- Maintenance friendly design. Bearings and shaft seal are maintainable without pump disassembly.

